

A NEW FORAMINIFER COMMENSAL ON CYCLAMMINA.

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Specimens of *Cyclammina* are occasionally found which, instead of being bilaterally symmetrical, have the last few chambers much extended on one side. Such specimens have a deep depression in the umbilical region of the same side. These have been noted in the material collected by the United States Bureau of Fisheries steamer *Albatross* from the northeastern coast of the United States in my examination of that material, but without a discovery of the cause. On examining material from *Albatross* station D2213 a number of specimens of *Cyclammina* with this character were noted, and a further search revealed the cause for the abnormal form.

It is caused by the attachment of a single-chambered species of foraminifera to the outside of the test of the specimen of *Cyclammina* and the further growth of the test about this. When the attached form falls away it leaves the resulting space unoccupied and the resulting depression. So far as the material shows this seems to be a one-chambered species with a chitinous wall somewhat arenaceous in parts but with little variation in size.

The position as shown in plate 25, figure 4, is at the edge of the aperture when the attachment is made. Later, by the continued growth of *Cyclammina* this position becomes more nearly umbilical. There is as a rule but a single attached specimen, but two may be attached, either on one side as shown in plate 25, figure 1, or there may be one on each side, as in figure 3. This at once suggests that little or nothing is known of the life habits of *Cyclammina* except that it is a heavy, bottom-living form. If the attached specimens were always on one side only it would suggest that *Cyclammina* might live on its side, but with specimens with both sides occupied this does not hold. *Cyclammina* might lie with its apertural face uppermost which would allow opportunity for the pseudopodia both of the attached form and of itself to rise easily to the surface of the bottom ooze. At any rate, *Cyclammina* seems too heavy to be a form with any great freedom of movement.

The position of the attached form near the aperture suggests a commensal condition. There is no fusion between the two, for the attached form falls away, leaving a clean-cut surface.

The degree of deviation from a symmetrical condition depends on the length of time of attachment. In figure 4 the attached specimen is on a large *Cyclammina* which has reached nearly its full development and the deviation is very slight. In smaller specimens like figure 2, where several chambers have been added since the attached species was in position, there is a marked deviation. In figure 3, where specimens are attached to both sides, a sort of symmetry results as both sides deviate from their normal line.

IRIDIA CONVEXA, new species.

Plate 25, figs. 1-4.

Description.—Test attached, single chambered, lower surface conforming to the surface of attachment, upper surface strongly convex, whole test slightly longer than wide; wall thin, chitinous, with a slight amount of arenaceous material either on the exterior or incorporated in the wall; aperture not evident; color yellowish-brown, horny. Diameter, 0.50 to 0.65 mm.

Type-specimen.—(U.S.N.M. Cat. No. 10441a) from *Albatross* D2213, off the northeastern coast of the United States; latitude 39° 58' 30'' N.; longitude 70° 30' W.; depth, 384 fathoms; bottom temperature, 39.5° F. At this station there are numerous specimens, all attached to specimens of *Cyclammina cancellata* H. B. Brady.

I have placed this species under the genus *Iridia* erected by Heron-Allen and Earland, although this species differs in some respects from the type-species *I. diaphana* Heron-Allen and Earland.

It is unusual among the foraminifera to find attached forms with any definite relation of position as seems to occur in the case of these two species, and although the idea of commensalism may not be demonstrated here it is at least strongly suggested.

EXPLANATION OF PLATE 25.

- FIG. 1. *Cyclammina cancellata*, with two specimens of *Iridia convexa* attached to the same side. *a*, side view; *b*, apertural view.
2. *Cyclammina cancellata*, with deep excavation in the umbilical region due to attachment of *Iridia convexa*. *a*, side view, *b*, apertural view.
3. *Cyclammina cancellata*, with specimens of *Iridia convexa* attached to the opposite sides.
4. Adult specimens of *Cyclammina cancellata*, with specimen of *Iridia convexa* attached near the aperture. *a*, side view; *b*, apertural view.
- All figures multiplied by 25.